

Amendments to the Specification:

At page 1 of the specification, please replace the title of the invention with the following replacement title:

DATA COMPRESSION METHOD FOR DIGITAL FILES

Please replace the paragraph beginning at p. 6 line 23 of the specification with the following amended paragraph:

FIG. 1 schematically illustrates the application of the data processing method in an image processing application. An image 20 is decomposed into an array of picture elements or pixels 22. The image 20 is typically a gray scale image. However, the gray scale image 20 may be one of the constituent color planes that are superimposed to create a color image. Color images are commonly displayed by superimposing red (R), green (G), and blue (B) color planes or superimposing cyan (C), magenta (M), yellow (Y), and black (K) color planes. Referring to FIG. 2, the luminous intensity of each pixel 22 of the image 20 is expressed as an ordered sequence of symbols 24 (indicated by a bracket) having four binary bits. A pixel having a four bit value can have an intensity equivalent to one of sixteen shades of gray ranging from black to white. For convenience, the intensities of the pixels 24 22 are illustrated as a rectangular array 26 of a plurality of ordered symbol sequences or blocks even though the blocks are typically processed in a sequential series of blocks. The present inventors recognized that while there is often statistical redundancy in the symbols of the serial sequence of data blocks, such as the repetition of the pixel value for the second 28 and third 30 pixels, there is often greater redundancy in the bits or symbols occupying a particular place or position in the plurality of ordered sequences. For example, the most significant bits (MSB) 32 of all the exemplary pixel values are the same. Likewise, the subjective effect of the value of a bit on the decompressed data is likely correlated to the bit's position in the ordered sequence. For example, pixels representing the sky in an image will be predominantly blue. Local variations in the shade of the sky will generally be accounted for by intensity variations expressed by changes in the least significant bit (LSB) 34 or a plurality of bits of lesser significance. A change in the MSB 32 for the four bit pixel values would correspond to a 50% variation in intensity which is unlikely for large areas of an image.

Appl. No. 09/885,320
Amdt. dated July 8, 2005
Reply to Office action of March 23, 2005

Please replace the paragraph beginning at p. 7 line 21 with the following amended paragraph:

In the method of the present invention, the data of the array 24 26 is partitioned along bit planes containing the bits occupying a particular place or plurality of places in the ordered sequences making up the array. For example, the most significant bits of the bit sequences may be grouped in a single bit plane 36. Likewise, the least significant bits or the two least significant bits might occupy a bit plane 38. For convenience, the bits included in the bit plane can be assigned to a file and processed. Lossless or lossy compression algorithms are applied to the data in the file to reduce the quantity of data in the file. An algorithm can be selected that is likely to produce high compression efficiency or optimize compression efficiency and data distortion. For example, applying run length encoding to the bit plane 36 comprising the most significant bits of the data of the array 26 may achieve high efficiency because there are likely to be substantial runs of like bits. Lossless compression of the most significant bit plane 36 avoids distortion of the decompressed data and the possibility of substantial changes in the data and, for example, the color of the pixel represented by the data. On the other hand, a different compression algorithm may be more appropriate to a bit plane comprising least significant bits, such as bit plane 38. In the case of image data, a lossy compression technique applied to a bit plane of less significant bits may provide high compression efficiency without substantially subjectively impacting quality of the decompressed image.